

Listing and Amendments to the Claims

This listing of claims will replace the claims that were published in the PCT Application and in the International Preliminary Examination Report:

1. (currently amended) In a system for processing a signal containing video data comprising groups of interleaved trellis encoded data packets, an apparatus for providing trellis decoded data, comprising:
 - first means ~~{2}~~ for adaptively filtering signal distortions;
 - first means ~~{5}~~ for identifying and re-encoding trellis decoded data as received from the first means ~~{2}~~ for adaptively filtering signal distortions;
 - a feedback filter ~~{8}~~ responsive to the re-encoded trellis decoded data ~~{6}~~; and
 - a trellis decoder ~~{3}~~ responsive to an output signal generated by the feedback filter, the trellis decoder providing trellis decoded data.
2. (currently amended) A system according to claim 1, wherein the first means ~~{2}~~ for adaptively filtering signal distortions is a first decision feedback equalizer.
3. (currently amended) A system according to claim 2, further including a second decision feedback equalizer ~~{4}~~ comprising the feedback filter ~~{8}~~ responsive to the re-encoded trellis decoded data ~~{6}~~.
4. (currently amended) A system according to claim 3, further comprising a module ~~{1}~~, the module ~~{1}~~ comprising the second decision feedback equalizer ~~{4}~~ and the first means ~~{5}~~ for identifying and re-encoding trellis decoded data as received from the first means ~~{2}~~ for adaptively filtering signal distortions.
5. (currently amended) A system according to claim 4, further comprising a plurality of modules, wherein a first module ~~{1}~~ is responsive to data from the first means ~~{2}~~ for adaptively filtering signal distortions, each succeeding module is responsive to data received from a preceding

module and the last trellis decoder ~~(3)~~ is responsive to data received from the last module.

6. (currently amended) A system according to claim 5, wherein each module further comprises:

a delay unit ~~(7)~~ for synchronizing data received from a previous stage; and

a feed forward filter responsive to data received from the delay unit ~~(7)~~.

7. (currently amended) A system according to claim 6, wherein the first means ~~(5)~~ for identifying and re-encoding trellis decoded data residing within the module ~~(1)~~ is adapted to generate a hard decision data output.

8. (currently amended) A system according to claim 6, wherein the first means ~~(5)~~ for identifying and re-encoding trellis decoded data residing within the module ~~(1)~~ is adapted to generate a soft decision data output.

9. (currently amended) A system according to claim 8, wherein the first means ~~(5)~~ for identifying and re-encoding trellis decoded data residing within the module ~~(1)~~ is adapted to generate a soft decision data output satisfying an equation

$$\tilde{I}_j = \sum_{m=1}^M P_{jm}^{(sp)} \cdot I(m)$$

where $I(m)$ is a channel symbol corresponding to a label $m = 1, 2, \dots, M$.

10. (original) In a system for processing video data comprising groups of interleaved trellis encoded data packets, a method of providing trellis decoded data comprising the steps of:

applying adaptive filtering to the video data and thereby generating a first output signal responsive to the adaptive filtering;

decoding and re-encoding the first output signal and thereby generating a re-encoded output signal;

applying the re-encoded output signal to a second adaptive filter and thereby generating a second output signal; and

applying the second output signal to a trellis decoder and thereby generating a decoded output signal.

11. (original) A system according to claim 10, further comprising the step of forming a module that performs the steps of:

decoding and re-encoding the first output signal; and
applying the re-encoded output signal to a second adaptive filter.

12. (original) A system according to claim 11, wherein each module further comprises a delay unit for synchronizing data received from a previous stage.

13. (original) A system according to claim 12, further comprising the step of cascading a plurality of modules so as to receive the first output signal and subsequently apply a final output signal to the trellis decoder and thereby generate the decoded output signal.

14. (original) A system according to claim 13, further comprising the step of applying the re-encoded output signal within each module to the feedback filter in the same module.

15. (original) A system according to claim 14, further comprising the step of decoding and re-encoding within each module so as to generate a re-encoded output signal that is a hard decision version of the interleaved trellis encoded data packets.

16. (original) A system according to claim 14, further comprising the step of decoding and re-encoding within each module so as to generate a re-encoded output signal that is a soft decision version of the interleaved trellis encoded data packets.

17. (original) A system according to claim 16, wherein the step of decoding and re-encoding trellis decoded data residing within each module generates a soft decision data output satisfying an equation

$$\tilde{I}_j = \sum_{m=1}^M P_{jm}^{(sp)} \cdot I(m)$$

where $I(m)$ is a channel symbol corresponding to a label $m = 1, 2, \dots, M$ and $P_{jm}^{(sp)}$ is the *a posteriori* probability of the $m^{(th)}$ channel symbol at time j for the survival path (sp) .

18. (currently amended) An equalizer/trellis decoder system for processing high definition television signals, comprising:

- a first adaptive filter {2};
- a trellis decoder and re-encoder {5} adapted to receive trellis encoded data packets from the first adaptive filter {2};
- a second adaptive filter {4} adapted to receive an input signal {6} generated by the trellis decoder and re-encoder {5}; and
- a final trellis decoder {3} adapted to receive an input signal from the second adaptive filter {4}.

19. (currently amended) The equalizer/trellis decoder system of claim 18 wherein the second adaptive filter {4} is a decision feedback equalizer further comprising:

- a feedback filter {8}; and
- a feed forward filter.

20. (currently amended) The equalizer/trellis decoder system of claim 19 further comprising a delay unit {7} adapted to receive as an input a signal {21} that is an input to the first adaptive filter {2}, the delay unit {7} being interconnected to and synchronizing data received by the feed forward filter.

21. (currently amended) The equalizer/trellis decoder of claim 20 wherein an output signal {6} generated by the trellis decoder and re-encoder {5} produces soft decision data.

22. (currently amended) A system according to claim 21, wherein the output signal ~~{6}~~ generated by the trellis decoder and re-encoder ~~{5}~~ satisfies an equation

$$\tilde{I}_j = \sum_{m=1}^M P_{jm}^{(sp)} \cdot I(m)$$

where $I(m)$ is the channel symbol corresponding to the label $m = 1, 2, \dots, M$ and $P_{jm}^{(sp)}$ is the *a posteriori* probability of the $m^{(th)}$ channel symbol at time j for the survival path (sp) .

23. (currently amended) The equalizer/trellis decoder of claim 19 wherein an output signal generated by the trellis decoder and re-encoder ~~{5}~~ produces hard decision data.

24. (currently amended) A system according to claim 18 wherein the first adaptive filter ~~{2}~~ is a Decision Feedback Equalizer operating in either (hard) automatic switching mode or soft automatic switching mode.